

# NCAR benchmarking applications- 2015 release

Ensuring that real applications perform well on NCAR computing platforms is critical for getting the best value out of complex and costly high-performance computing and storage resources. Climate and weather applications are large, often with millions of lines of code, and are generally difficult to configure in a way that permits ease of use for things such as system deployments, upgrades, and procurements.

Thus, NCAR has developed a suite of application kernels, micro-benchmarks, and full applications with moderate input cases that can be used as proxies for the full applications and still provide meaningful information and insights into system performance. A few of these are well-known benchmarks that are commonly used in HPC for characterizing system performance.

NCAR's benchmarking applications are listed in the tables below, along with file names, sizes, and checksums. These packages include source files, build scripts, and input data sets required to compile and run the applications. In cases where the benchmarks depend on applications and libraries that are not part of the package distributions, you will find version number and download details in the README files.

## Page contents

- [Application Benchmark Instructions](#)
- [Globus instructions](#)
  - [Step 1: Obtain a Globus account](#)
  - [Step 2: Install Globus Connect Personal](#)
  - [Step 3: Use Globus to download benchmarks](#)

**Release Date:** February 2, 2015

**Last Updated:** August 29, 2018

The **benchmark download packages** are available through the Globus-based NCAR Data Sharing Service. Instructions are given below for obtaining a Globus account, installing the required Globus software, and downloading the benchmark packages via the **NCAR HPC Benchmarks** endpoint. See the Globus instructions below for more information.

Instructions for all benchmarks are available via Google Docs or direct download at this link:

## Application Benchmark Instructions

These are the instructions for each of the application benchmarks in the table below.

Application Benchmarks	Description	File	Size (Bytes)	MD5 Checksum
HOMME	HOMME benchmark and HOMME_COMM communication kernel	HOMME_v1.tar.gz	2728264	b35d135f52b488d0bf9c1a07f2d02a93
HPCG	High Performance Conjugate Gradient Solver	hpcg-2.4_v1.tar.gz	69974	fef8b6614ddaf3c45b8dd1b8fb867df7
LES	Large Eddy Simulation benchmark	LES_v1.tar.gz	73200	f9017e36b1ea0f02a2169770b37fad54
MG2	Morrison Gettelman cloud microphysics kernel	MG2kernel_v1.tar.gz	282822	53befeb7e418c074c80f6a5ad025144c
MPAS-A	MPAS Atmosphere benchmark	MPAS_3.2_v1.tar.gz	2259609261	e9736920454952afb7e13c2e4f859457
POPperf	POP Ocean model benchmark	POPperf_v1.tar.gz	66480926	0fd078478dc6b5f326701ac09713fa49
WRF	Weather Research and Forecasting model	WRFV3_BENCH_v1.tar.gz	13260795166	4d5a7c02656dca8042ceb e1e656c793b
CESM	Community Earth System Model	Used in numerical correctness and system acceptance testing. <a href="http://www.cesm.ucar.edu/">http://www.cesm.ucar.edu/</a>		

I/O and Microbenchmarks	Description	File	Size (Bytes)	MD5 Checksum
STREAM	Node level memory benchmark	STREAM_v1.tar.gz	10268	ee520d700a1fef3f746b9a8117952635
SHOC	Scalable Heterogeneous Computing (GPU benchmark)	shoc_v1.tar.gz	10418387	f3a4146180cb720a04104ee40bd161ea
OSU-MPI	MPI communication benchmarks	osu-micro-benchmarks-4.4.1_v1.tar.gz	151586	4bae164fc0aecd955adae1e9a9dc48d9

<b>IOR</b>	I/O bandwidth and latency test	ncar_ior_v1.tgz	144,608	dc91a37af717005c87ec1752524ef67b
<b>pyReshaper</b>	Application I/O kernel	pyResBench_v1.tgz	1,938,268,372	67c9231e8bacb644d1a952b8793dc609
<b>mdtest</b>	Metadata performance test	ncar_mdtest_v1.tgz	93,074	c9f69c6cdc335409f96ebce7764bad

## Globus instructions

### Step 1: Obtain a Globus account

Go to [www.globus.org](http://www.globus.org) and click the **Sign Up** button in the upper-right corner.

### Step 2: Install Globus Connect Personal

Go to [www.globus.org](http://www.globus.org). Under **Products** select **Globus Connect** and then **Get Globus Connect Personal**. Versions are available for Mac OS X, Linux and Windows.

### Step 3: Use Globus to download benchmarks

1. Log in at [www.globus.org](http://www.globus.org) with your Globus account
2. Select **Transfer Files**
3. In the left-hand window, enter **NCAR HPC Benchmarks** as the endpoint
4. In the right-hand window, enter an endpoint at your own site or the endpoint that you established with Globus Connect
5. Select the benchmark files you wish to download and click the right-hand arrow

Your download will be submitted through the Globus Transfer service. You will receive an email when your transfer has completed or you can monitor from the Transfer window by selecting **refresh list** in the right-hand window.